



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the PATENT application of

**Tom Schilson et al.**

Application No.: 09/454,333

Filing Date: December 3, 1999

For: FLAT CABLE AND MODULAR  
ROTARY ANVIL TO MAKE  
SAME

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)  
) Group Art Unit: 2831  
)  
) Examiner: William H. Mayo III  
)  
) Atty. Dkt.: 115584-00287  
) Customer No. 27557  
)  
) Date: March 22, 2004  
)

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents

P.O. Box 1450

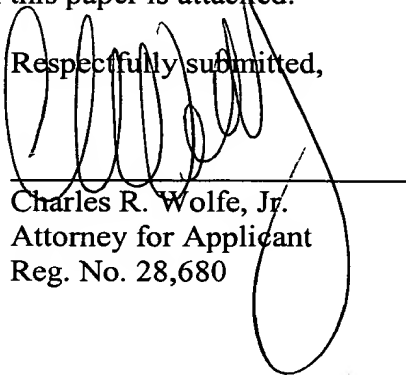
Alexandria, VA 22313-1450

**APPEAL BRIEF TRANSMITTAL**

Sir:

Submitted herewith in connection with the above-identified application, please find an original and two copies of an Appeal Brief. Additionally, a request for a two month extension is also submitted. A check for the statutory fee of \$330.00 (large entity) is attached. Authorization is also given to charge or credit any differences of overpayment to Deposit Account No. 23-2185. A duplicate copy of this paper is attached.

Respectfully submitted,

  
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Date: April 22, 2004



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|                                 | ) | Customer No. 27557            |
| For: FLAT CABLE AND MODULAR     | ) |                               |
| ROTARY ANVIL TO MAKE            | ) | Date: April 22, 2004          |
| SAME                            | ) |                               |

**APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192**

**Mail Stop Appeal Brief - Patents**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

For the appeal to the Board of Patent Appeals and Interferences from the decision dated July 24, 2003 of the primary Examiner finally rejecting claims 1-30 and 80-84 in connection with the above-identified application, Applicants/Appellants submit the following brief in accordance with 37 C.F.R. § 1.192.

04/23/2004 CNGUYEN 00000045 09454333

02 FC:1402

330.00 OP

1. Real Party In Interest

The inventors Tom Schilson and Steve Kamps, assigned their entire right, title and interest in the above-identified application to Methode Electronics, Inc., a Delaware corporation.

2. Related Appeals and Interferences

There are no other related appeals or inferences known to Appellants, Appellants' legal representative, or Assignee, which would directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. Status of Claims

Claims 1-30 and 80-84 are pending.

In the July 24, 2003 final Office Action, claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,250,127 to Hara.

Additionally, claims 3-4, 7-8, 10, 12, 16-21 and 81-82 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 3,168,617 to Richter.

Also, claims 5, 24, and 28-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 4,952,020 to Huber.

Furthermore, claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 3,239,916 in view of Love.

Finally, claims 26-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 4,780,157 to Coon.

4. Status of Amendments

No amendment was filed subsequent to the July 24, 2003 final Office Action.

5. Summary of the Invention

The present invention generally relates to a flat electrical cable (for example 100 of Fig. 7) including an upper insulator layer (for example 120), a lower insulator layer (for example 130) connected thereto by substantially continuous parallel spaced-apart seams (for example 150), and an intermediate layer having individual strands of conductors (for example 140) or conductor groups (240 for example). The seams of the electrical cable can be formed without adhesive, such as by ultrasonically bonding the upper and lower layers. By forming the cable in the above manner, the proper spacing between the conductors and the proper positions of the conductors are maintained during and after bonding the upper and lower layers.

6. Issues Presented for Review

(1) Whether claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84 are anticipated under 35 U.S.C. § 102(b) in view of U.S. Patent No. 5,250,127 to Hara.

(2) Whether claims 3-4, 7-8, 10, 12, 16-21 and 81-82 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 3,168,617 to Richter.

(3) Whether claims 5, 24, and 28-29 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 4,952,020 to Huber.

(4) Whether claim 14 is unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 3,239,916 in view of Love.

(5) Whether claims 26-27 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 4,780,157 to Coon.

7. Grouping of Claims

For purposes of this appeal, independent claims 1, 18, 21, 22 and 30 do not stand or fall together. Independent claim 1 and dependent claims 2, 9, 11, 13 stand or fall together. Dependent claims 3-8, 10, 12, 14-17 and 80 do not stand or fall with independent claim 1. Dependent claims 19, 20 and 81 do not stand or fall with independent claim 18. Dependent claims 82 does not stand or fall with independent claim 21. Independent claim 22 and dependent claims 23 and 25 stand or fall together. Dependent claims 24, 26-29 and 83 do not stand or fall with independent claim 22. Dependent claim 84 does not stand or fall together with independent claim 30.

8. Arguments

A. Summary of Argument

In summary, the claims stand rejected under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a) in view of main reference U.S. Patent No. 5,250,127 to Hara. However, Hara fails to disclose, teach, suggest or render obvious all of the claim limitations of the claimed invention. Specifically, Hara does not disclose any of (a) a cable with an intermediate layer of conductors

that do not have an adhesive residue thereon; (b) a cable with seams positioned between adjacent conductors that have a textured surface pattern; or (c) a cable with ultrasonically bonded seams. Instead, Hara discloses a cable with an intermediate layer of conductors disposed between two layers of tape (col. 1, lines 61-68) and seams that have only smooth surfaces as indicated by the shade lines in Fig. 3. Moreover, nothing in Hara either teaches or suggests ultrasonically bonded seams. To the contrary, one skilled in the art would interpret tapes 10 of Hara as requiring an adhesive bond.

Appellants' respectfully request that the rejections of claims 1-30 and 80-84 be reversed. Each claim rejection is discussed in detail below.

B. Rejection under 35 U.S.C. § 102(b) of claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84

Claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,250,127 to Hara. Hara discloses a conventional cable, as seen in Fig. 3, including upper and lower insulation tapes 10 with a plurality of conductors 2 and 4 disposed between tapes 10. See col. 1, lines 61-68. Anticipation requires that every limitation of a claim must identically appear in a prior art reference. See *Gechter v. Davidson*, 43 U.S.P.Q.2d 1030, 1032 (*Fed. Cir.* 1997). However, Hara does not disclose all of the claim limitations of claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84, as suggested in the final office action, and therefore fails to anticipate the claimed invention. Briefly, Hara fails to disclose, teach or suggest an electrical cable with either conductors without adhesive residue thereon or seams with a textured surface pattern.

Each of independent claims 1, 22 and 30 recites an electrical cable with upper and lower insulator layers and an intermediate layer of conductors that do not have adhesive residue. In

contrast, Hara discloses upper and lower insulation tapes 10 with conductors 2 disposed therebetween. The ordinary and customary meaning of “tape” includes an adhesive.

Additionally, if the Hara cable does not include an adhesive as suggested, the cable would be inoperable due to the separation of the upper and lower insulating layers 10 from each other and from conductors 2. No other attachment means is disclosed by Hara. For these reasons, one skilled in the art would understand that insulation tapes 10 of Hara include adhesive. This is further supported by Hara’s disclosure that a technique of effective removal of insulation tape 10 from conductor 4 is not known (col. 1, lines 66-68), implying tape 10 is bonded to conductor 4, such as by an adhesive.

Moreover, the assertion that because Hara discloses the use of adhesives with respect to the invention, Hara’s failure to disclose an adhesive with respect to Fig. 3 is evidence of lack of an adhesive is unfounded. To the contrary, Hara discloses insulation tape 10 in column 1, lines 61-68. Hara’s failure to illustrate the adhesive in Fig. 3 is not dispositive of no adhesive. Fig. 3 of Hara shows a prior art cable (col. 2, lines 46-47). A patent applicant’s duty of providing an enabling disclosure for the claimed invention does not apply to the description of the prior art.

In view of the above, the conductors 2 and 4 of Fig. 3 of Hara would therefore have an adhesive residue thereon because they are sandwiched between adhesive insulator tapes 10.

Additionally, independent claims 1 and 30 each recites that seams positioned between conductors have a textured surface pattern. Applicants’ disclosure describes and illustrates the textured surface pattern as being non-smooth. For example, on page 16, lines 17-19 of Applicants’ disclosure, knurled protrusions 74a (see Fig. 6) form the textured pattern of the seams 150 between the conductors 140 (see Fig. 7) in contrast to the smooth seams 115 near the edge of the cable 100. Hara teaches only smooth, i.e. without texture, seams. Specifically, the

seams of the Hara cable between conductors 2 and 4 are smooth, , as seen in Fig. 3. The Office Action erroneously points to shade lines (marked as "25") as texture. The shading lines of Fig. 3 do not indicate texture but instead indicate a flat smooth surface. Furthermore there is no description in Hara to suggest the insulation tape 10 of Hara is textured. Therefore, Hara discloses only a smooth non-textured cable.

It is clear that neither limitation of conductors without adhesive residue thereon, as recited in independent claims 1, 22 and 30, nor seams adjacent conductors with a textured surface pattern, as recited in independent claims 1 and 30, appear in Hara. Absence from the prior art reference of any claimed element negates anticipation. See *Rowe v. Dror*, 42 U.S.P.Q.2d 1550, 1553 (*Fed. Cir.* 1997). Therefore, the rejection of independent claims 1, 22 and 30 and their respective dependent claims 2, 6, 9, 11, 13, 15, 23, 25, 80 and 83-84 under 35 U.S.C. §102(b) should be reversed.

Moreover, dependent claims 2, 6, 9, 11, 13, 15, 23, 25, 80 and 83-84 recite additional features also not found in Hara. For example, claim 6 recites that at least one of the seams is ultrasonically welded. As discussed above, Hara teaches an adhesive bond via insulator tapes 10 of Fig. 3. Additionally, Hara does not disclose any other method of bonding insulator tapes 10, much less an ultrasonic weld, and therefore cannot anticipate claim 6. The Office Action admits that ultrasonic welding is a structural limitation but suggests that ultrasonic welding does not result in any structural difference between the prior art, such as extrusion of the cable, and the claimed invention. Nothing in Hara describes extruding the cable as a method of bonding. To the contrary, extrusion is a molding process that doesn't require bonding. More specifically, the extrusion process involves heating resin to a molten state and molding the resin around the conductors forming a one-piece cable. Thus the ultrasonic weld of claim 6 is structurally



different than an extruded cable of the prior art because it bonds two separate layers rather than molding the cable as one-piece. Additionally, as recognized in the Office Action, the ultrasonic weld of claim 6 is structurally different than the adhesive bond between tapes 10 of Fig. 3 of Hara because an ultrasonic weld does not involve adhesive. Therefore, at least one seam that is ultrasonically welded, as recited in claim 6, is not identically found in Hara, thereby negating anticipation.

Also, dependent claim 15 recites that the seams positioned between adjacent conductors have a knurled textured surface pattern. See, for example, knurled seams 150 of cable 100 in Fig. 7 of Applicants' disclosure. The ordinary and customary meaning of "knurled" is rough or including protuberances or knobs, i.e. non-smooth. As discussed above, Hara only discloses a cable with smooth seam surfaces as indicated by the shade lines on tape 10 of Fig. 3. Therefore, Hara fails to anticipate seams with a textured surface pattern much less seams with a knurled textured surface pattern, as recited in claim 15.

Dependent claims 80, 83 and 84 each recites among other elements that the lower surface is substantially planar along the length of the cable. The Office Action misinterprets the term planar by suggesting that the lower surface of lower tape 10 of Fig. 3 of Hara is located in a plane and is therefore substantially planar. Planar connotes a single or the same plane. As seen in Fig. 3 of Hara, the lower surface of lower tape 10 includes a plurality of both raised surfaces to accommodate conductors 2 and 4 and indented seams disposed between the raised surfaces. Since the raised surfaces and the seams are located in different planes, the surface of lower tape 10 is not substantially planar, as recited in claims 80, 83 and 84. Hara teaches only a non-planar surface for lower tape 10 and therefore fails to anticipate the claims 80, 83 and 84.

C. Rejection of claims 3-4, 7-8, 10, 12, 16-21, and 81-82 under 35 U.S.C. 103(a) as being unpatentable over Hara in view of Richter

Claims 3-4, 7-8, 10, 12, 16-21, and 81-82 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 3,168,617 to Richter. A prima facie case of obviousness has not been established because none of Hara, Richter or any combination of Hara and Richter discloses, teaches, suggests, or renders obvious all of the claim limitations of the claimed invention.

i. Dependent claims 3-4, 7-8, 10, 12 and 16-17

Regarding dependent claims 3-4, 7-8, 10, 12 and 16-17, as discussed above in section B, Hara does not disclose an electrical cable with either conductors that do not have an adhesive residue thereon or seams position between adjacent conductors that have a textured surface pattern, as recited in independent claim 1. Richter does not cure these deficiencies. Richter merely discloses an electrical cable with copper conductors 10 disposed between polyester insulating members 11 and 12 which are bonded by adhesive 13.

Moreover, these dependent claims recite additional features that further distinguish them from the prior art. For example, claim 17 recites that the cable has a linear density of substantially 4.35 grams per foot. The Office Action misinterprets this claim feature as both defining a weight per volume and requiring less than 4.35 grams per foot. Specifically, the Office Action relies on Richter as disclosing a density, as mass per volume, that is less than 4.35. Initially, claim 17 recites a weight per length, i.e. grams per foot, and not a weight per volume. Moreover, the claim recites a density of substantially 4.35 grams per foot and not less than 4.35, as suggested in the Office Action.

In view of the above, neither Hara nor Richter, or any combination thereof discloses or renders obvious all of the claim limitations of dependent claims 3-4, 7-8, 10, 12 and 16-17. Therefore, the rejection of claims 3-4, 7-8, 10, 12 and 16-17 under 35 U.S.C. § 103(a) should be reversed.

ii. Claims 18-21, 81 and 82

Independent claims 18 and 21 each recite among other elements an electrical cable with upper and lower polyester layers connected by substantially continuous parallel spaced apart ultrasonically bonded seams. As discussed above in section B with regard to claim 6, Hara teaches an adhesive bond via insulator tapes 10 of Fig. 3. No other method of bonding insulator tapes 10 is disclosed in Hara. The Office Action admits that ultrasonic welding is a structural limitation but suggests that ultrasonic welding does not result in any structural difference between the prior art, such as extrusion of the cable, and the claimed invention. However, extrusion is a molding process that doesn't require bonding. As mentioned above, the extrusion process involves heating resin to a molten state and molding the resin around the conductors forming a one-piece cable. Thus the ultrasonically bonded seams of claims 18 and 21 are structurally different than an extruded cable of the prior art because they bond two separate layers rather than molding the cable as one-piece. Additionally, as recognized in the Office Action, an ultrasonic weld is structurally different than the adhesive bond between tapes 10 of Fig. 3 of Hara because an ultrasonic weld does not involve adhesive. Therefore, the ultrasonically bonded seams of claims 18 and 21, are not disclosed, suggested or rendered obvious by Hara.

Also, independent claims 18 and 21 recite that seams position between adjacent conductors have a textured surface pattern. As discussed above in section B with respect to

claims 1 and 30, Applicants' disclosure defines and illustrates textured surface pattern as being non-smooth. Hara discloses cable seams with only smooth surfaces, as indicated by shade lines 25. Nothing in Hara suggests inclusion of a textured surface on the cable seams. Thus, Hara fails to disclose, suggest or render obvious the seams with textured surface patterns of claims 18 and 21.

Richter also fails to disclose, suggest or render obvious the above features of ultrasonically bonded seams or seams positioned between adjacent conductors with textured surface patterns. To the contrary, the insulating members 11 and 12 of Richter are bonded by an adhesive 13 and the surfaces of members 11 and 12 are smooth, as seen in Fig. 2.

In view of the above, neither Hara nor Richter, or any combination thereof discloses or renders obvious all of the claim limitations of independent claims 18 and 21. Therefore, the rejection of claims 18 and 21 and their dependent claims 19-20, 81 and 82 under 35 U.S.C. § 103(a) should be reversed.

Moreover, dependent claims 19-20, 81 and 82 recite additional features that further distinguish them from the prior art. For example, claim 19 recites that the seams positioned between adjacent conductors have a knurled textured surface pattern and claim 20 recites that the seams have a repeating linear segment textured surface pattern substantially perpendicular to the length of the cable. As discussed above, none of Hara, Richter or any combination thereof teaches or suggests seams with a textured surface pattern, much less a knurled or perpendicular linear segment textured surface pattern of claims 19 and 20, respectively.

Also, claims 81 and 82 recite among other elements that the lower surface is substantially planar along the length of the cable. As discussed above in section B with respect to claims 80, 83 and 84, Hara fails to disclose a cable with a substantially planar lower surface due to the

raised surfaces of tape 10 for accommodating conductors 2 and 4. Moreover, nothing in Richter suggests modifying only the lower surface of the Hara cable to be substantially planar.

Therefore, neither Hara nor Richter, or any tenable combination thereof disclose, suggests or renders obvious to substantially planar lower surface of claims 81 and 82.

**D. Rejection of claims 5, 24 and 28-29 under 35 U.S.C. § 103(a) as being unpatentable over Hara in view of Huber**

Claims 5, 24 and 28-29 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,250,127 Hara in view of U.S. Patent No. 4,952,020 to Huber. However, Hara fails to disclose, suggest or render obvious all of the claim limitations of independent claims 1 and 22, as discussed above in section B, and likewise their dependent claims 5, 24 and 28-29, including conductors without adhesive thereon or seams with a textured surface pattern. Huber does not cure the deficiencies of Hara. Huber merely discloses a cable having optical fibers 2 with a surrounding jacket 4.

Therefore, a prima facie case of obviousness has not been established since Hara, Huber or any combination thereof fails to disclose or render obvious the claimed invention. Thus, the rejection of claims 5, 24 and 28-29 under 35 U.S.C. § 103(a) should be reversed.

**E. Rejection of claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Hara in view of Love**

Claim 14 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,250,127 in view of U.S. Patent No. 3,239,916. However, Hara fails to disclose, suggest or render obvious all of the claim limitations of independent claim 1, as discussed above in section B, and likewise dependent claim 14, including conductors without adhesive thereon and seams with a textured surface pattern.

Love does not remedy the deficiencies of Hara. Love teaches a cable including upper and lower insulator tapes 11 and 12 with conductors 13-17 therebetween. Layers 11 and 12 of Love include aperture perforations 20 to facilitate cutting of the cable. As seen in Figs. 3 and 4 of Love, the surfaces of layers 11 and 12 are smooth and not textured.

Therefore, a prima facie case of obviousness has not been established with respect to claim 14, and the rejection under 35 U.S.C. § 103(a) should be reversed.

F. Rejection of claims 26-27 under 35 U.S.C. § 103(a) as being unpatentable over Hara in view of Coon

Claims 26-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,250,127 to Hara in view of U.S. Patent No. 4,780,157 to Coon. However, Hara fails to disclose, suggest or render obvious all of the claim limitations of independent claim 22, as discussed above in section B, and likewise dependent claims 26-27, including conductors without adhesive thereon. Coon fails to cure the deficiencies of Hara. Coon merely discloses a cable 210 with a plurality of conductors 18, 19 bonded together by insulating bonding material 20, as seen in Figs. 1A, 1B, 2A and 2B.

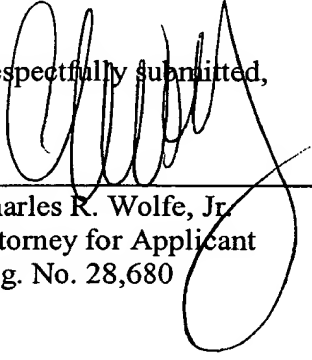
Therefore, a prima facie case of obviousness has not been established with respect to claims 26-27, and the rejection under 35 U.S.C. § 103(a) should be reversed.

\* \* \*

9. Conclusion

In view of the foregoing, Appellants submit that the rejection of claims 1-2, 6, 9, 11, 13, 15, 22-23, 25, 30, 80 and 83-84 under 35 U.S.C. § 102(b), and the rejections of claims 3-4, 7-8, 10, 12, 16-21, 24, 26-29, and 81-82 under 35 U.S.C. § 103(a) are untenable and should be reversed.

Respectfully submitted,



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## APPENDIX A – COPY OF CLAIMS ON APPEAL

Claim 1. A flat electrical cable comprising:

an upper insulator layer;

a lower insulator layer connected to the upper layer along substantially continuous parallel spaced seams; and

an intermediate layer comprised of individual strands of conductors which lie adjacent and substantially parallel to the seams, wherein the conductors do not have an adhesive residue thereon, wherein the seams positioned between adjacent conductors have a textured surface pattern, and wherein the seams positioned along edges of the flat electrical cable have a substantially smooth surface pattern.

Claim 2. The flat electrical cable of Claim 1 wherein

the upper layer includes a plurality of raised surfaces running parallel to each other along the length of the flat cable.

Claim 3. The flat electrical cable of Claim 1 wherein

the upper and lower insular layers are polyester.

Claim 4. The flat electrical cable of Claim 1 wherein

the conductors are made of at least one of a copper material and a copper alloy.

Claim 5. The flat electrical cable of Claim 1 wherein

at least one of the conductors is a fiber optic cable.



Claim 6. The flat electric cable of Claim 1 wherein  
at least one of the seams is ultrasonically welded.

Claim 7. The flat electrical cable of Claim 6 wherein  
the at least one of the seams is positioned along an edge of the flat electrical cable and is broader  
than at least one of the seams positioned between adjacent conductors.

Claim 8. The flat electrical cable of Claim 7 wherein  
the at least one of the seams being positioned along an edge of the flat electrical cable is  
produced by a broad protrusion on an ultrasonic welding anvil.

Claim 9. The flat electrical cable of Claim 6 wherein  
at least one of said seams being positioned along an edge of the flat electrical cable is cut so as  
to form a smooth edge thereon.

Claim 10. The flat electrical cable of Claim 1 wherein  
the seams positioned along edges of the flat electrical cable are broader than seams positioned  
between adjacent conductors.

Claim 11. The flat electrical cable of Claim 1 wherein  
the seams positioned along edges of the flat electrical cable are cut so as to form a smooth edge  
thereon.

Claim 12. The flat electrical cable of Claim 1 wherein the conductors are exposed at an end portion of the flat cable beyond the upper, and lower insulator layers.

Claim 13. The flat electrical cable of Claim 1 wherein the cable includes a continuous seam except for a nonbonded area where the upper and lower insulator layers are not connected.

Claim 14. The flat electrical cable of Claim 1 wherein the cable includes a continuous seam except for a nonbonded area where the upper and lower insulator layers include windows that expose the conductors.

Claim 15. The flat electrical cable of Claim 1 wherein the seams positioned between adjacent conductors have a knurled textured surface pattern.

Claim 16. The flat electrical cable of Claim 3 wherein the conductors include seven conductors.

Claim 17. The flat electrical cable of Claim 16 wherein the flat electrical cable has a linear density of substantially 4.35 grams of per foot.

Claim 18. A flat electrical cable comprising:

an upper layer of polyester having a ribbed surface;

a lower layer of polyester connected to the upper layer along substantially continuous parallel space apart ultrasonically bonded seams; and

individual strands of copper conductors lying substantially parallel and adjacent to the seams between the upper and lower layers, wherein the seams positioned between adjacent conductors have a textured surface pattern, and wherein the seams positioned along edges of the flat electrical cable have a substantially smooth surface pattern.

Claim 19. The flat electrical cable of Claim 18 wherein

the seams positioned between adjacent conductors have a knurled textured surface pattern.

Claim 20. The flat electrical cable of Claim 18 wherein

the seams positioned between adjacent conductors have a repeating linear segment textured surface pattern, wherein the repeating linear segments are substantially perpendicular to a length of the flat electrical cable.

Claim 21. A flat electrical cable comprising:

an upper layer of polyester having a ribbed surface;

a lower layer of polyester connected to the upper layer along substantially continuous parallel space apart ultrasonically bonded seams; and

individual strands of copper conductors lying substantially parallel and adjacent to the seams between the upper and lower layers, wherein the seams positioned between adjacent

conductors have a textured surface pattern, wherein the seams positioned along edges of the flat electrical cable have a first zone and a second zone, and wherein

the first zone is adjacent to one conductor of the conductors and extends substantially parallel to the one conductor, and the first zone having a knurled textured surface pattern, and where

the second zone is located between the first zone and one edge of the edges, and the second zone having a smooth textured surface patterns.

Claim 22. A flat cable comprising:

an upper insulator layer;

a lower insulator layer connected to the upper insulator layer along substantially continuous parallel spaced apart seams; and

an intermediate layer comprised of conductor groups which lie adjacent and substantially parallel to the seams, and wherein the conductor groups do not have an adhesive residue thereon.

Claim 23. The flat cable of Claim 22 wherein  
one of the conductor groups includes a single conductor.

Claim 24. The flat cable of Claim 22 wherein  
one of the conductor groups includes an optical fiber.

Claim 25. The flat cable of Claim 22 wherein

one of the conductor groups includes a tandem conductor group, wherein the tandem conductor group includes two substantially identical conductors positioned adjacent to each other.

Claim 26. The flat cable of Claim 22 wherein

one of the conductor groups includes a dual stacked conductor group, wherein the dual stacked conductor group includes two substantially identical conductors, wherein a first conductor of the two substantially identical conductors is stacked on a second conductor of the two substantially identical conductors of the dual stacked conductor group.

Claim 27. The flat cable of Claim 22 wherein

one of the conductor groups includes a triple stacked conductor group, wherein the triple stacked conductor group includes three substantially identical conductors, wherein a first conductor of the three substantially identical conductors is positioned adjacent to a second conductor of the three substantially identical conductors of the triple stacked conductor group, and wherein the second conductor of the three substantially identical conductors is positioned adjacent to a third conductor of the three substantially identical conductors of the triple stacked conductor group.

Claim 28. The flat cable of Claim 22 wherein

one of the conductor groups includes a wire rope conductor group, wherein the wire rope conductor group includes a plurality of wire conductors wound together.

Claim 29. The flat cable of Claim 25 wherein

another of the conductor groups includes a wire rope conductor group, wherein the wire rope conductor group includes a plurality of wire conductors wound together.

Claim 30. A flat electrical cable comprising:

an upper insulator layer;

a lower insulator layer connected to the upper layer along substantially continuous parallel spaced apart seams; and

an intermediate layer comprised of individual strands of conductors which lie adjacent and substantially parallel to the seams, and the conductors do not have an adhesive residue thereon, wherein the seams positioned between adjacent conductors have a first textured surface pattern, and wherein the seams positioned along edges of the flat electrical cable have a second surface pattern, and wherein a surface roughness of the first textured surface pattern is greater than a surface roughness of the second textured surface pattern.

Claims 31-79. Canceled.

Claim 80. The flat electrical cable of claim 1, wherein the upper layer includes a plurality of raised surfaces running parallel to each other along the length of the cable and the lower surface is substantially planar along the length of the cable.

Claim 81. The flat electrical cable of claim 18, wherein the upper layer includes a plurality of raised surfaces running parallel to each other along the length of the cable and the lower surface is substantially planar along the length of the cable.

Claim 82. The flat electrical cable of claim 21, wherein  
the upper layer includes a plurality of raised surfaces running parallel to each other along the  
length of the cable and the lower surface is substantially planar along the length of the cable.

Claim 83. The flat electrical cable of claim 22, wherein  
the upper layer includes a plurality of raised surfaces running parallel to each other along the  
length of the cable and the lower surface is substantially planar along the length of the cable.

Claim 84. The flat electrical cable of claim 30, wherein  
the upper layer includes a plurality of raised surfaces running parallel to each other along the  
length of the cable and the lower surface is substantially planar along the length of the cable.